

## WHAT IS CLAIMED IS:

1. A surface coated phosphor comprising a thin coating of a rare earth oxide disposed on an uncoated phosphor.

5 2. The surface coated phosphor of claim 1, wherein said uncoated phosphor is a sulfide or oxide phosphor.

3. The surface coated phosphor of claim 2, wherein said uncoated phosphor is a sulfide phosphor.

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4. The surface coated phosphor of claim 3, wherein said sulfide phosphor is a ZnS based phosphor.

5. The surface coated phosphor of claim 4, wherein said ZnS  
15 based phosphor is selected from the group consisting of ZnS:Cu; ZnS:Cu,Al; (Zn,Cd)S:Ag,Al; and combinations thereof.

6. The surface coated phosphor of claim 5, wherein said ZnS based phosphor is ZnS:Cu.

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7. The surface coated phosphor of claim 1, wherein said rare earth oxide is  $Y_2O_3$ .

8. A process for preparing a surface coated phosphor  
25 comprising a thin coating of a rare earth oxide disposed on an uncoated phosphor, the process comprising contacting said uncoated phosphor with a rare earth hydroxide gel solution to obtain a rare earth hydroxide gel coated phosphor, drying said rare earth hydroxide gel coated phosphor to obtain a  
30 dried rare earth hydroxide gel coated phosphor, and heat treating said dried rare earth hydroxide gel coated phosphor.

9. The process of claim 8, wherein said rare earth hydroxide gel solution is prepared by dissolving a precursor of said rare earth oxide in a medium comprising an organic solvent to obtain a precursor solution, optionally adding water to the precursor solution, and further optionally heating the precursor solution.

10. The process of claim 9, wherein the precursor is a rare earth organic compound.

11. The process of claim 10, wherein the rare earth organic compound is a rare earth alkoxide.

12. The process of claim 11, wherein said rare earth alkoxide is a rare earth isopropoxide.

13. The process of claim 9, wherein said organic solvent is toluene.

14. The process of claim 8, wherein said heat treating of the dried rare earth hydroxide gel coated phosphor is carried out at a temperature of from about 225°C to about 500°C.

15. The process of claim 8, wherein said uncoated phosphor is a sulfide or oxide phosphor.

16. The process of claim 8, wherein said uncoated phosphor is a sulfide phosphor.

17. The process of claim 16, wherein said sulfide phosphor is a ZnS based phosphor.

18. The process of claim 17, wherein said ZnS based phosphor is ZnS:Cu.

19. The process of claim 8, wherein said rare earth oxide is  
5  $Y_2O_3$ .

20. The surface coated phosphor prepared by the process of claim 8.

10 21. A process for preparing a surface coated phosphor comprising a thin coating of rare earth oxide disposed on an uncoated phosphor comprising:

(a) preparing a solution of a rare earth alkoxide in a medium comprising an organic solvent and water;

15 (b) heating the solution from (a) to hydrolyze the rare earth alkoxide to obtain a solution containing rare earth hydroxide gel;

(c) contacting the uncoated phosphor with the solution obtained in (b) to obtain a gel coated phosphor;

20 (d) drying the gel coated phosphor; and

(e) heat treating the dried phosphor obtained in (d).

22. The surface coated phosphor prepared by the process of claim 21.

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23. A surface coated phosphor comprising a continuous thin coating of a rare earth oxide disposed on an uncoated phosphor prepared by a process comprising contacting said uncoated phosphor with a rare earth hydroxide gel solution  
30 to obtain a rare earth hydroxide gel coated phosphor, drying said rare earth hydroxide gel coated phosphor to obtain a dried rare earth hydroxide gel coated phosphor, and heat

treating said dried rare earth hydroxide gel coated phosphor.

24. A surface coated phosphor comprising a continuous thin coating of rare earth oxide disposed on an uncoated phosphor prepared by a process comprising:

(a) preparing a solution of a rare earth alkoxide in a medium comprising an organic solvent and water;

(b) heating the solution from (a) to hydrolyze the rare earth alkoxide to obtain a solution containing rare earth hydroxide gel;

(c) contacting the uncoated phosphor with the solution obtained in (b) to obtain a gel coated phosphor;

(d) drying the gel coated phosphor; and

(e) heat treating the dried phosphor obtained in (d).

25. The surface coated phosphor of claim 23, wherein said rare earth hydroxide gel solution is prepared by dissolving a precursor of said rare earth oxide in a medium comprising an organic solvent to obtain a precursor solution, optionally adding water to the precursor solution, and further optionally heating the precursor solution.

26. The surface coated phosphor of claim 25, wherein the precursor is a rare earth organic compound.

27. The surface coated phosphor of claim 26, wherein the rare earth organic compound is a rare earth alkoxide.

28. The surface coated phosphor of claim 27, wherein said rare earth alkoxide is a rare earth isopropoxide.

29. The surface coated phosphor of claim 25, wherein said organic solvent is toluene.

5 30. The surface coated phosphor of claim 23, wherein said heat treating of the dried rare earth hydroxide gel coated phosphor is carried out at a temperature of from about 225°C to about 500°C.

10 31. The surface coated phosphor of claim 23, wherein said uncoated phosphor is a sulfide or oxide phosphor.

32. The surface coated phosphor of claim 23, wherein said uncoated phosphor is a sulfide phosphor.

15 33. The surface coated phosphor of claim 32, wherein said sulfide phosphor is a ZnS based phosphor.

34. The surface coated phosphor of claim 33, wherein said ZnS based phosphor is ZnS:Cu.

20 35. The surface coated phosphor of claim 23, wherein said rare earth oxide is  $Y_2O_3$ .